

Integrated Vehicle-Based Safety Systems Initiative

Paper No. 1482

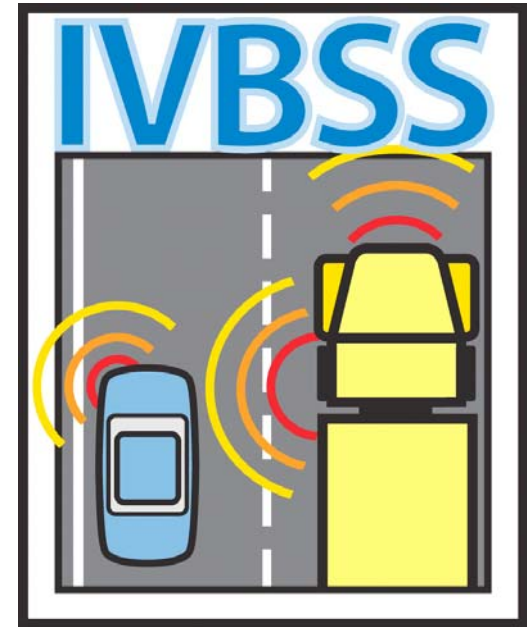
Jack Ference

United States

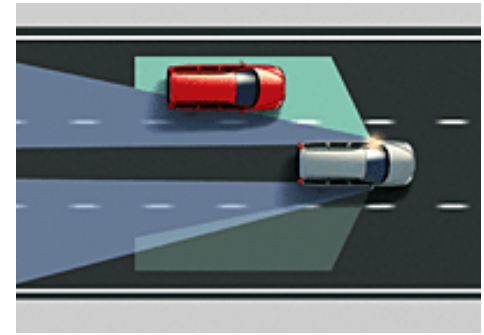
Department of Transportation

2006 ITS World Congress

8-12 October 2006



Outline



- Program Overview
- Target Crash Problem
- Integrated System Warning Functions
- Major Program Activities
- Program Timeline
- First Year Accomplishments
- Summary – Key Program Dates

Integrated Vehicle-Based Safety Systems (IVBSS) Initiative

Goal: Work with industry to accelerate introduction of integrated safety systems into the U.S. vehicle fleet of **light vehicles and heavy trucks**

Addresses three Crash Types:

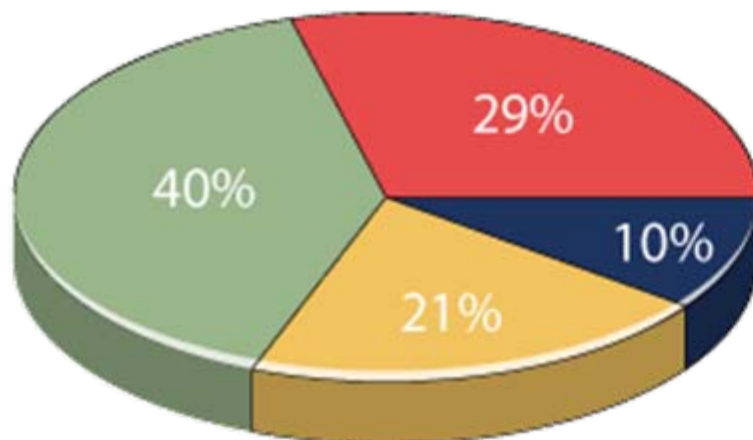
- Rear End
- Road Departure
- Lane Change/Merge



Target Crash Problem

Light Vehicle Crashes

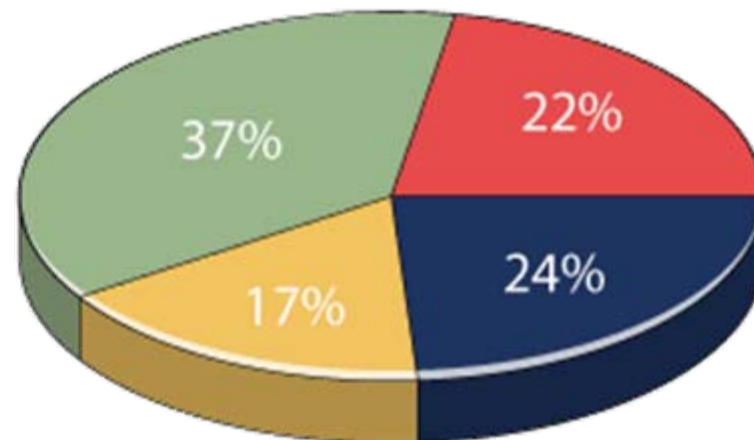
3,659,000 Crashes
1,535,000 Injured
19,106 Killed



■ Lane Change ■ Rear End ■ Other ■ Run Off Road

Medium/Heavy Trucks

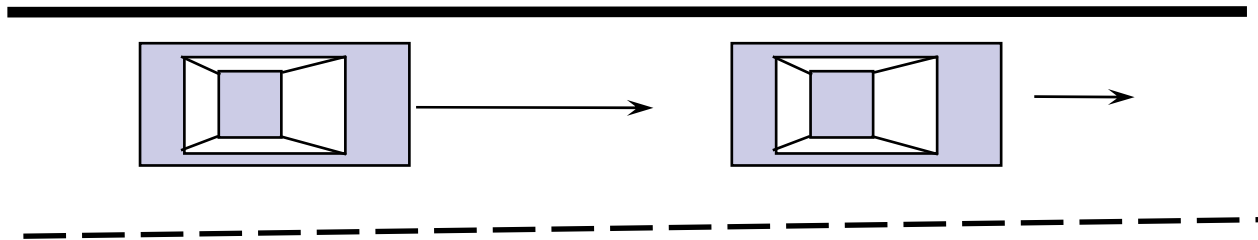
218,000 Crashes
75,000 Injured
1,336 Killed



Studies conducted by the U.S. DOT indicate that widespread deployment of an integrated system combining rear-end, lane change and roadway departure crash countermeasures could prevent a significant number of these crashes each year.

Integrated System Functions

- **Forward crash warning (FCW)**
 - Provides warnings to drivers to assist them in avoiding, or mitigating, crashes with the rear end vehicles traveling in the same direction



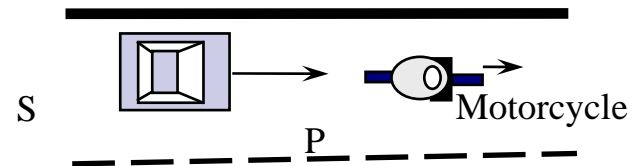
Integrated System Functions

- Forward crash warning (FCW) cont'd

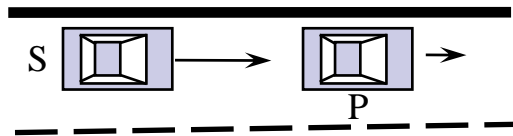
Approaching stopped vehicle



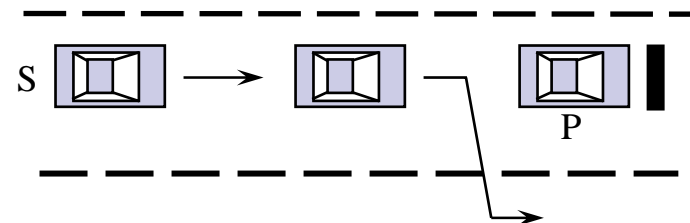
Approaching low-profile vehicle



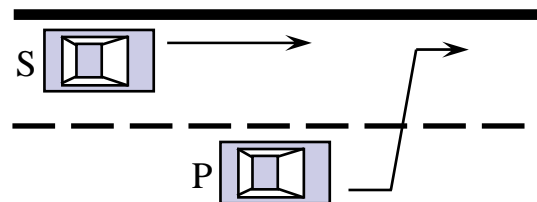
Approaching slower vehicle



Lead veh lane change reveals stopped

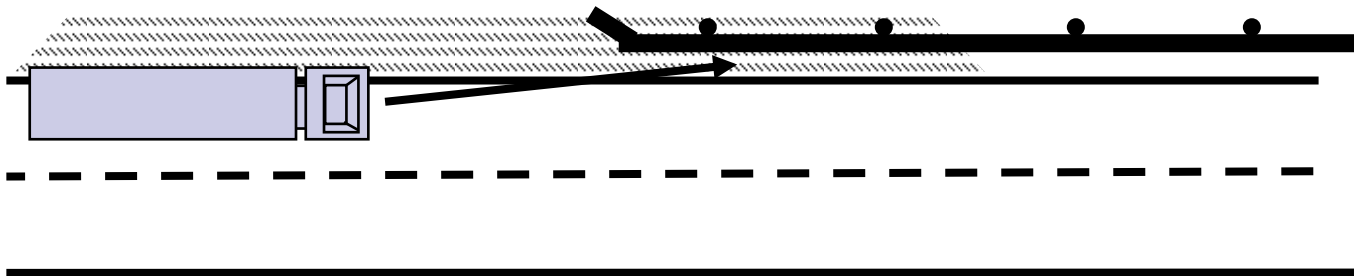


Lead vehicle cut-ins/merges



Integrated System Functions

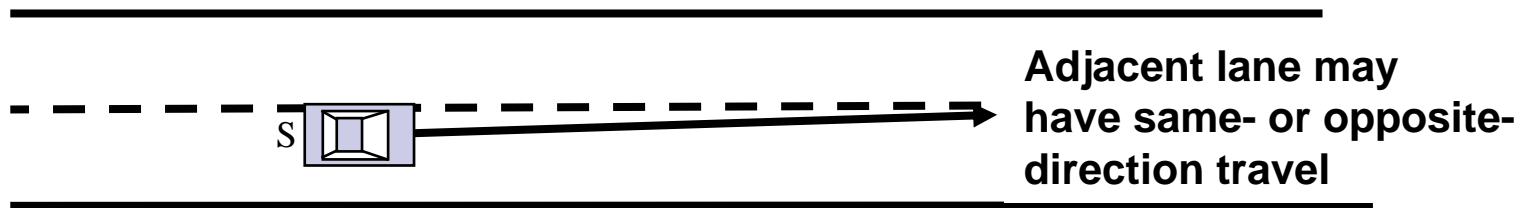
- **Lateral drift warning (LDW)**
 - Provides warnings to drivers that are drifting from their lane



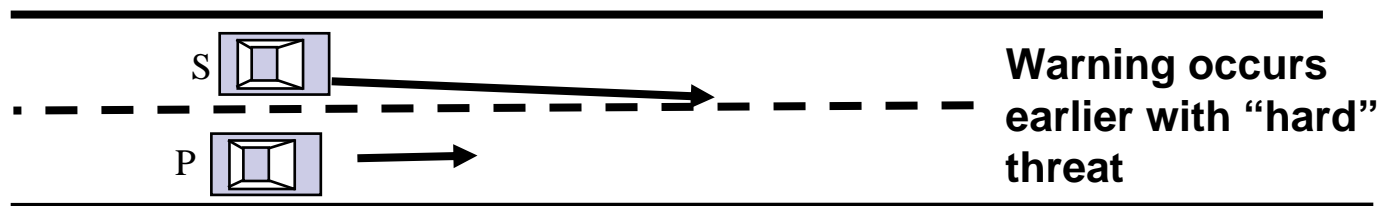
Integrated System Functions

- **Lateral drift warning (LDW) cont'd**

Drifting into adjacent lane

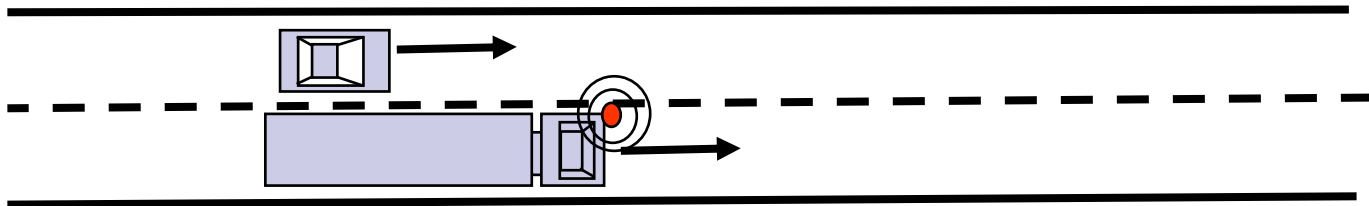


Drifting into adjacent occupied lane



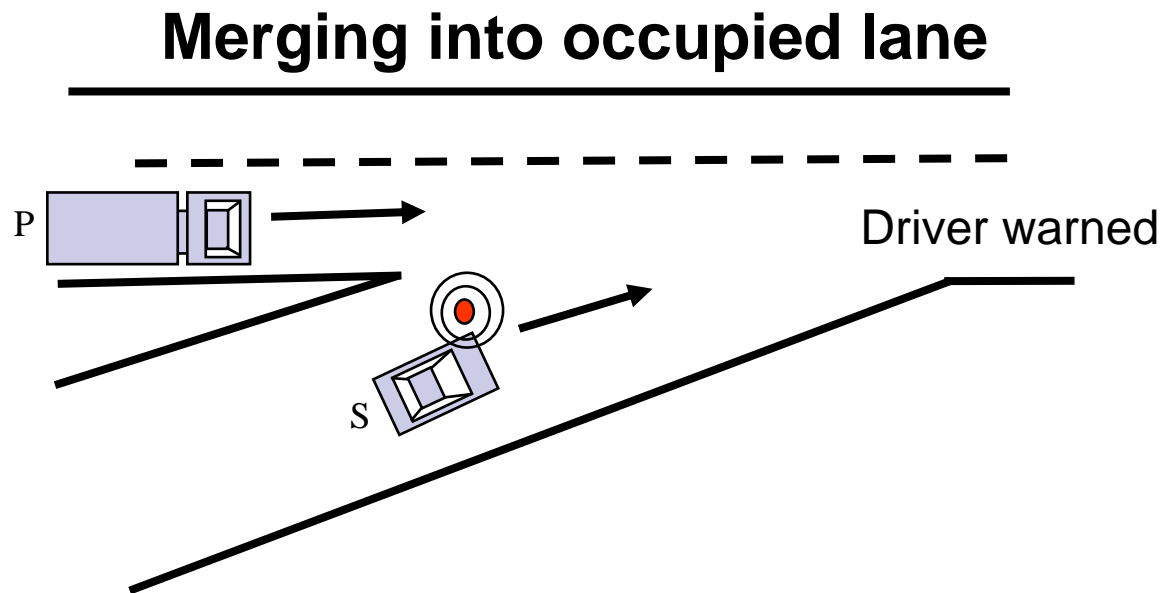
Integrated System Functions

- **Lane change warning (LCW)**
 - Provides full-time side object presence indication, as well as turn signal triggered warnings of unsafe maneuvers
 - Based on adjacent or approaching vehicles



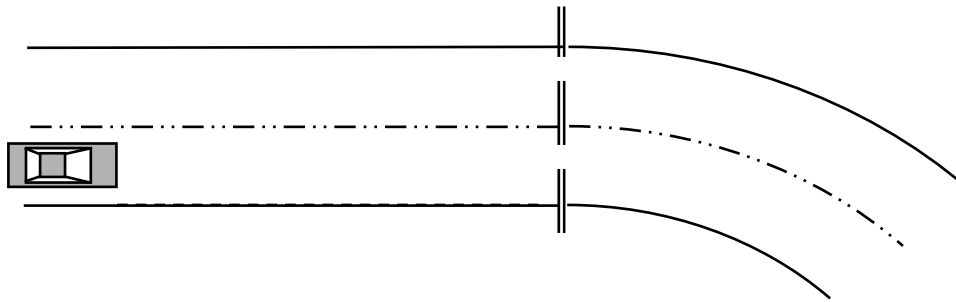
Integrated System Functions

- Lane change warning (LCW) cont'd



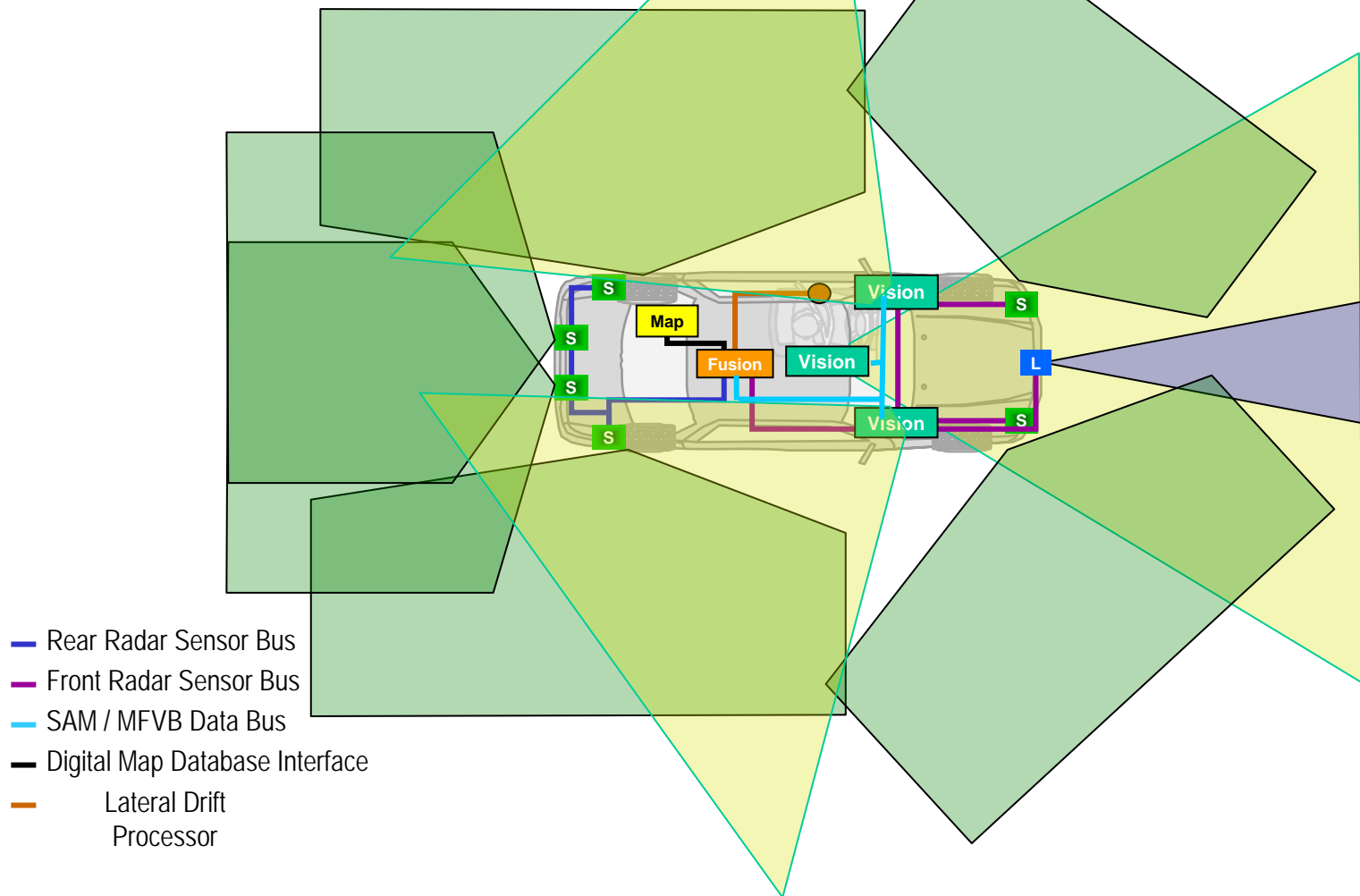
Integrated System Function

- **Curve-speed warning (CSW)**
 - Provides warnings to drivers that they may be driving too fast for an upcoming curve.
 - **Only on Light Vehicle platform**



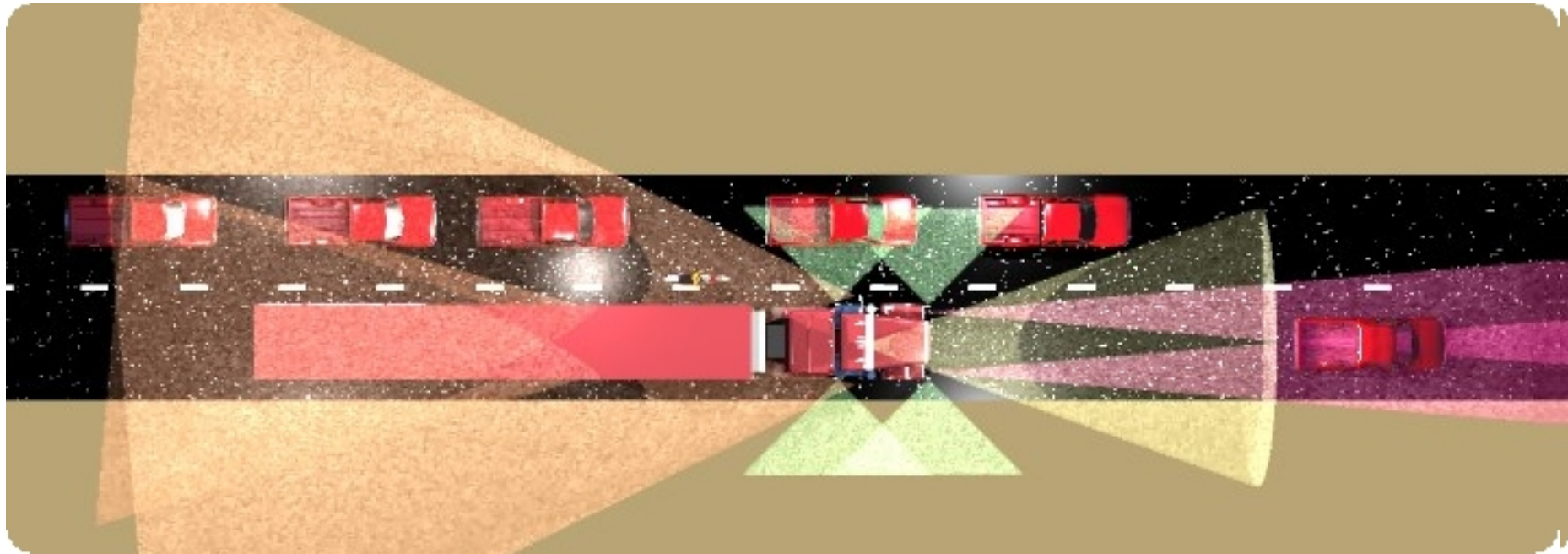
Integrated System Sensor Suite

Light Vehicle Platform



Integrated System Sensor Suite

Heavy Truck Platform



Note: For clarity, rear vision not shown

Major Program Activities

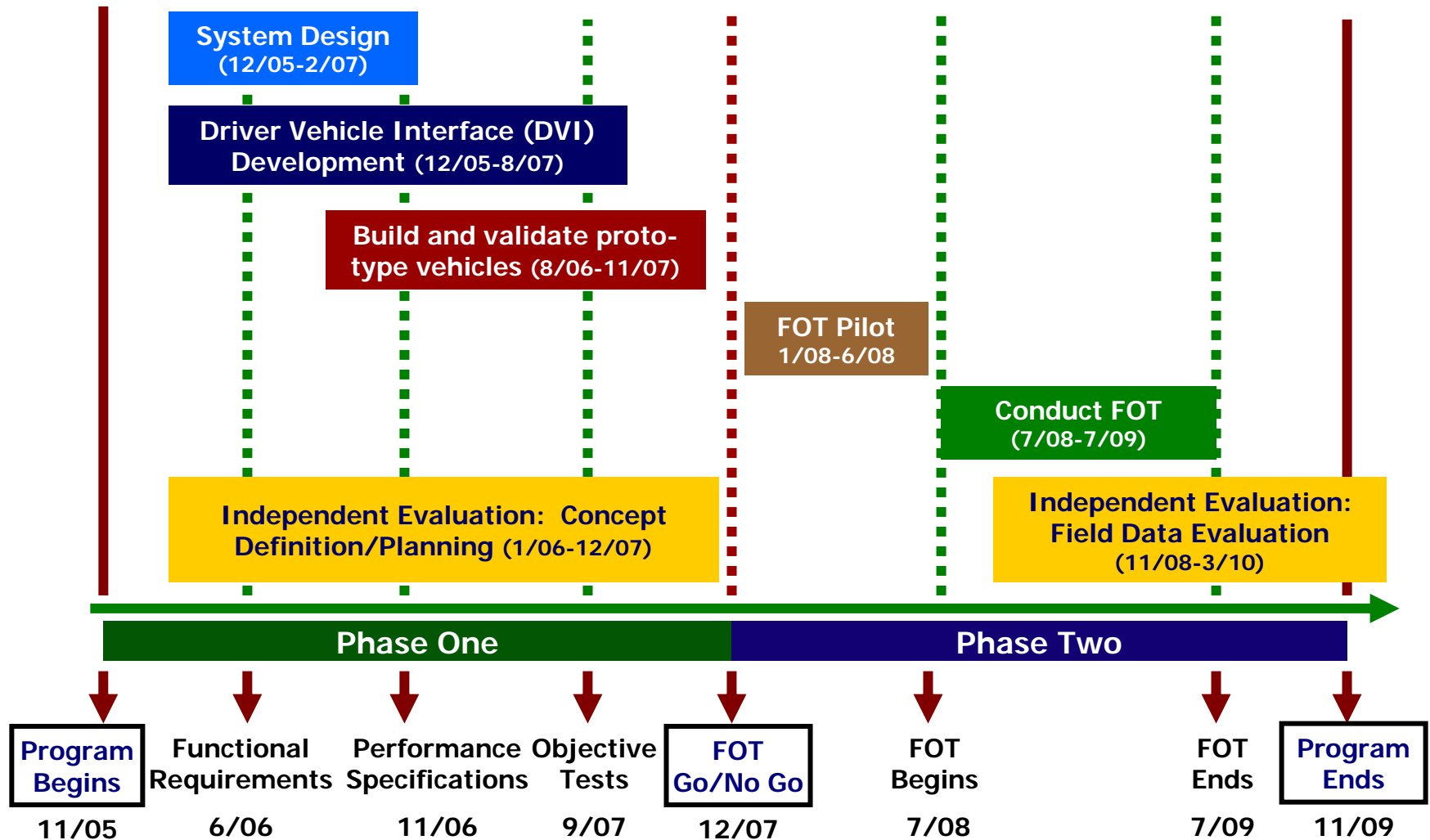
Phase 1:

- **Integrated System design and development**
 - Development of functional requirements and performance specifications
 - Human Factors/DVI development
- **Building engineering development vehicles**
 - Including integrated warning characteristics, high quality DVI, and prototype **data acquisition system**
- **Verification Testing – Objective test procedures**
- **Independent Evaluation Planning**
- **12/07: Decision point for Phase 2**

Phase 2:

- **Field Operational Test – fleet build, pilot testing**
- **Evaluation of Safety Benefits**

IVBSS Program Timeline



First Year Accomplishments

- **System Design and Development underway**
 - Demonstration of initial FCW and LCW capability
- **Initial DVI Experiment completed**
 - DVI Option Space defined
- **Key Program Documents produced**
 - System Architecture
 - Preliminary Functional Requirements
 - Preliminary Performance Specifications
 - Draft Set of Objective Test Procedures
- **Draft Independent Evaluation Plan**

Summary – Key Program dates

- **July-August 2007** – Prototype vehicles ready for testing
- **August 2007** - Driver Vehicle Interface design complete
- **November 2007** – Objective testing completed
- **December 2007 – Phase 2 Go/No-Go Decision**
- **January-June 2008** – Fleet build and pilot testing
- **July 2008-June 2009** – Full-scale FOT; data collection
- **January 2010** – Final Program Report publicly available
- **June 2010** – Independent Evaluation (Safety Benefits) Report

Questions?

Jack Ference

Intelligent Technologies Research Division
National Highway Traffic Safety Administration
400 Seventh Street, SW (NVS-332)
Washington, D.C. 20590
(202) 366-0168
jack.ference@dot.gov



IVBSS webpage: www.its.dot.gov/ivbss/index.htm

END